

# ABSTRACT OF THE DISCLOSURE

This ion source is set up to satisfy a relation

$$L < 3.37B^{-1}\sqrt{V_A} \times 10^{-6}$$

where the arc voltage applied between a plasma production  
5 vessel 2 and a filament 8 is  $V_A[V]$ , the magnetic flux density  
of a magnetic field 19 within the plasma production vessel 2  
is  $B[T]$ , and the shortest distance from a most frequent electron  
emission point 9 located almost at the tip center of the  
filament 8 to a wall face of the plasma production vessel 2

10 is  $L[m]$ .